Using a landscape scale to approach resources management and farm functions: the case of vanishing wooded structures and small ruminants itinerancy over the agrarian matrix

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Introduction

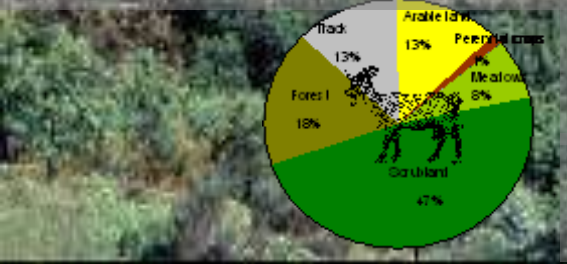
The diversity depletion of traditional rural landscapes could be the major threat of a required new multifunctional rural landscape, as a consequence of the European and National agrarian policies. The increasing compactness of woodland and agricultural matrixes has been particularly promoted by the loss of local regulation (population and farming abandon), and production intensification of nearest and most fertile soils and thrust aside of the others. Last six years, the heterogeneity of landscape interface between the woodland and agricultural matrixes was investigated in three rural communities of Trás-os-Montes concerning two threatened landscape process: (1) the vanishing punctual, linear and spatial wooded structures of agricultural matrix (scattered trees, hedgerows and fences, and woodlots) and (2) the flocks' itinerancy of native sheep and goats.

Methods

In previous works (Castro in press-a, Castro in press-b), authors discriminated 4 main zones in the agricultural matrix according with its actual wooded features pattern: households' surroundings, meadows, hills and farthest fields. A time series analyses, concerning to the ten most representative 2ha hexagonal plots by each zone and rural community, was performed by ESRI ArcView software above aerial photographs from 1958, 1968, 1978, 1985 and 1995. Photographs were orthorectified by PCI OrthoEngine and interpreted from present to past in order to absolute coincidence of each feature over time. Fieldwork allowed identifying actual tree species occurring in each registered feature. A GPS operator (Trimble GeoExplorer II), getting along the shepherd during the entire journey, monitored the itineraries of 2 sheeps and 2 goats flocks monthly, from May 1999 till May 2000. Temperature and vegetation communities crossed by flocks' itineraries were auxiliary noted, joining data about spatial and temporal coordinates recorded by GPS.

Results

Figures represent the main wooded structures that nowadays exist at the study sites. Main trees species are oak (re), chestnut (ca), walnut (no), poplar (ch), ash (fr), alder (al), elm (ol) and cherry (ce). The diversity of their punctual , linear and spatial character is important near households and meadows. However, time series analysis shows that structures should be important some decades before. Graphics show totals (curved lines with marks) and trends (straight lines) of hedgerows (above), scattered trees (middle) and woodlots (bellow), as also as transformations of their character. At meadows, scattered trees were reduced from 6 to 4 trees/ha and hedgerows were reduced from 90 m/ha to 50 meters/ha. Circular graphics show the use of territory made by sheep and goats herds, remarking the importance of agricultural (arable land and perennial crops) / woodland (forest and scrubland) matrixes interface in shepherding dynamic.



Discussion and Conclusion

The wooded structures of agricultural matrix suffered a severe reduction, particularly in the last decade; a vanishing character could be attributed to hedgerows at hills and farthest areas. Nowadays, their amounts are only a small part than four decades before. By other hand, no swaps among linear, punctual or spatial character occur which was interpreted as a strict function associated to their life: fencing, animal forage, summer sheltering, handcraft supplies, etc. A lack of these functions demand due to both absence of local farming management and new farming systems of low connectivity among productions, leads to trees and hedgerows cut down to obtain cash incomes. Spatial structures amount (woodlots) wasn't apparently affected; nevertheless important changes in areas location were detected. Linear and punctual structures reduction contributes to increase compactness of agricultural and woodland matrixes; ecological and aesthetics consequences could be anticipated if nothing occurs to stop it. Consequences won't be only at ecosystem level (soil loss, hydrological disturbance, seed bank removal) but also at landscape level. If wildlife, particularly at low trophic levels, would be threatened by the reduction of contact surface with agroecosystems high productivity, also traditional farming landscape process, such as small ruminants shepherding, could be threatened by the decline of open fields needed to access remote areas of forage (such as farthest meadows and fallow fields) and sheltering. Landscape evaluation level might be introduced in further CAP issues, in order to preserve these kind of ecological dynamics and to get engaged, in fact, with futures developments towards a multifunctional rural landscape.

References

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hills

farthest fields

households' surroundings

meadows